REMARKS

Before discussing the rejections over the prior art, Applicants deem it prudent to set forth what they consider to be their invention. As presently claimed, the invention is directed to a method of coating a glass substrate and a coated glass fiber prepared by the method.

The claimed invention is a method which utilizes a coating composition which has not to Applicant's knowledge been applied to a glass substrate. The method comprises:

(a) providing a glass substrate;

(b) applying to the glass substrate a coating composition comprising:

(1) from 1% to 98% by weight of a solventless, epoxy resin, reaction product of epichlorohydrin and at least one component selected from the group consisting of bisphenol A and bisphenol F, which reaction product is liquid at 20°C;

(2) from 1% to 98% by weight of a water-dilutable epoxy resin hardener;

(3) from 1% to 98% by weight of water; and

(4) optionally additives; and

(c) curing the coating composition.

Claims 1, 4-6 and 8-12 stand rejected under 35 USC 103(a) as being unpatentable over Nakamura et al. (US 5,633,042; hereinafter Nakamura) in view of Hoefer et al. (US 2004/0087684 A1; hereinafter Hoefer '684). Applicants respectfully submit that Nakamura and Hoefer '684 whether considered alone or in combination neither teach nor suggest the

present invention.

Nakamura discloses a process for manufacturing a prepeg for use as an electric insulating material. The prepeg is prepared by the process comprises mixing a main epoxy resin composition and a subsidiary resin composition containing a hardener in a molten condition and coating a reinforcing member which is generally a cloth fabricated from glass fibers, heating the coated cloth to permit the epoxy resin to permeate the coated reinforcing member and continuing heating the coated substrate to partially harden the resin.

The process disclosed in Nakamura differs from the process of the present invention in that a solid epoxy resin is heated to the molten state and mixed with the hardener composition and immediately applied to the coated fibers, maintained in the molten state by additional heating and partially hardened by the additional heating. The process of Nakamura does not utilize a coating composition containing water and an epoxy resin which is liquid at 20°C. It is clear from the Nakamura disclosure that the epoxy resin substantially contains no solvent and is in a molten state (see col. 3, lines 13, col. 5, lines 57-61; col. 7, lines 55-57; col. 8, lines 22-24; col. 11, line 21; col. 12, lines 26-27; col. 14, lines 2, 3 and 12; col. 16, lines 64-67; col. 17, line 55; col. 18, lines 28-30; col. 20, lines 43-44; col. 22, lines 29-33; col. 23, lines 8-10 and 58; col. 24, lines 10-13, 47, 48; col. 27, lines 51-54; col. 29, lines 47-49 and 62-63; col. 32, lines 10-12; col. 33, lines 55-57; and col. 38, lines 11-13. A review of all of these citations set out above, clearly teaches that the epoxy resin utilized in the Nakamura process must be heated to an elevated temperature to be

maintained in the molten state. As set forth in Webster's New College Dictionary, 3rd Edition, the term molten refers to a material which is made liquid by heat: melted. A copy of page 723 from Webster's New College Dictionary is enclosed. Applicants respectfully submit that Nakamura is not pertinent to the present invention since it requires the use of epoxy resin which is a solid at ordinary temperatures and must be heated to be in a molten state when used in the process.

The provision that the epoxy resin useful in the practice of the Nakamura process, must be in a molten state, clearly distinguishes the epoxy resin from the liquid epoxy resin useful in the aqueous composition of the present invention.

It is clear that the Nakamura resin composition is not an aqueous composition since it requires that the resin be heated and melted before application to the fibrous sheet-shaped material.

It is clear from the process disclosed in Nakamura that the process cannot use an aqueous composition. As shown, a uniform mixture of the epoxy resin and the hardener is prepared at an elevated temperature above the melting point of the epoxy resin. As shown in the examples, the mixture of the hardener and the epoxy resin is applied to the fibrous sheet material at a temperature about 60°C and can be as high as 130°C. The resin composition is maintained under a vacuum to remove any gases which may be present in the composition so that there are no voids in the resin when the resin is applied to the fibrous substrate at an elevated temperature.

Applicants invite the Examiner's attention to the processes disclosed in Figs. 13 and

14 which show that the fused and mixed resin is maintained under a vacuum to remove any solvents or gases which may be present in the fused resin. Applicants submit that the Nakamura process is different from the process of the present invention and utilizes a different epoxy resin which when cured would provide a cured epoxy resin which is different from the cured epoxy resin of the present invention.

Applicants submit that Nakamura neither teaches nor suggests a process which utilizes an epoxy resin which is liquid at 20°C, a mixture of an epoxy resin liquid at 20°C with a hardener and water. Applicants submit that the complex process disclosed in Nakamura is required since the epoxy resin is not a liquid at 20°C and requires additional heating and treating steps to maintain the mixture of the epoxy resin and curing agent in a liquid state so that penetration of the fibrous sheet material can be obtained.

In addition, the mixture of the epoxy resin and the hardener utilized in the Nakamura process is substantially solvent free. This would mean that the composition does not contain low boiling point materials which could include water. This can be seen from the process disclosed in Figs. 13 and 14 which show that the fused epoxy resin and the hardener composition are maintained under vacuum to remove any volatile or gaseous materials from the mixture so that voids in the prepeg can be avoided. Applicants respectfully submit that Nakamura would neither teach nor suggest to one skilled in the art the process of the present invention.

The deficiencies in Nakamura et al. are not cured by combination with Hoefer '684. Hoefer '684 utilizes an epoxy resin and a water-dilutable epoxy resin hardener along with

organic fibers and fillers.

The epoxy resin useful in the Hoefer '684 is a liquid epoxy resin. As described in Hoefer '684 reference, the fibers are polymer fibers and not the amorphous glass fibers coated by the process of the present invention.

In addition, the Hoefer '684 composition must always contain water. The water is at least partly present due to the water dilutable epoxy resin hardeners useful in the coating composition of the invention.

Contrary to the Examiner's speculation, the composition of Hoefer '684 could not be utilized in the Nakamura process. As disclosed in Nakamura, the mixture of resin and a hardener which is impregnated onto the fiber substrate is a solventless mixture (does not contain low boiling point materials). A solventless or water-free mixture is required in the Nakamura process since the fused resin and hardener mixture are applied to the substrate at an elevated temperature and the presence of low boiling point materials cannot be tolerated due to the imperfections and voids which would be present in the prepeg if volatile materials such as water and gases were present in the impregnating mixture. As pointed out above, Figs. 13 and 14 illustrate a preferred process of the invention wherein the fused resin and the fused hardener mixture which are separated are maintained under a vacuum to remove volatile materials from the compositions. The fused compositions are mixed immediately before application to the fibrous sheet material.

Applicants submit that substitution of the coating composition of Hoefer '684 in the process of Nakamura would provide a process which was not operable due to the

presence of water and solvents in the coating composition. Applicants therefore respectfully submit that Hoefer '684 does not cure the deficiencies in Nakamura since the use of the composition of Hoefer '684 in the Nakamura process would not be viable and would not achieve the objectives of the Nakamura process. Applicants submit that the references are not combinable.

Applicants therefore respectfully request that the rejection of the claims over the combination of Nakamura with Hoefer '684 be reconsidered and withdrawn.

Claims 6, 8, 10 and 12 stand rejected under 35 USC 102(b) as anticipated by Nakamura et al. (US 5,633,042; hereinafter Nakamura). Applicants respectfully submit that Nakamura does not anticipate the present invention.

To be a reference on which a rejection under 35 USC 102(b) can be based, the reference must show each and every limitation in the claims. Applicants submit that Nakamura fails since it neither teaches nor suggests the present invention.

The Examiner is correct in stating that claims 6, 8, 10 and 12 are product-by-process claims. However, Applicants submit that it would be clear to one skilled in the art that the glass coated with the composition of the present invention would by necessity be different from glass coated with the Nakamura composition.

The composition of the present invention comprises a liquid epoxy resin formed from the reaction of bisphenol F or A with epichlorohydrin, a water-dilutable epoxy resin hardener and water. The composition is applied to the glass and cured.

It would be well understood by one skilled in the art that glass coated with the

composition of the present invention is a different material from glass coated with the composition disclosed in Nakamura. The glass coated with the composition of the present invention would be different from glass coated with the composition of Nakamura since the basic starting materials for the composition of the present invention and the composition of Nakamura are different. Different starting materials would provide a different cured polymer which would be coated on the glass substrate.

The difference in the starting materials, an epoxy resin liquid at 20°C used in the process of the present invention and the epoxy resin useful in the Nakamura process which must be heated and melted at a temperature in the range of at least 60°C would provide different cured epoxy resin materials. It is well known in the art that different epoxy resins provide cured epoxy compositions which have different properties. This is well known to one skilled in the art since there are a large variety of epoxy resins available to provide cured compositions with different properties. If all epoxy resins provided the cured resins with the same properties, one epoxy resin would be useful for all applications. One skilled in the art would readily understand that the variety of available epoxy resins are required to obtain cured compositions with different properties.

Nakamura fails as a reference on which a rejection under 35 USC 102(b) can be based since there is neither teaching nor suggestion that the cured epoxy resin be formed from an epoxy resin which is liquid at 20°C. All of the resins disclosed in Nakamura must be fused (melted) to provide a solventless water-free mixture of the molten epoxy resin with the molten hardener composition. As would be well known in the art, the solid epoxy resins

useful in the Nakamura process would provide a different epoxy coating on a glass substrate due to the different chemical structure of the epoxy resin in relation to the epoxy resin liquid at 20°C useful in the practice of the present invention. Applicants therefore respectfully submit that the rejection of claims 6, 8, 10 and 12 under 35 USC 102(b) over Nakamura must fail. Applicants therefore respectfully request favorable consideration and withdrawal of the rejections under 35 USC 102(b) of claims 6, 8, 10 and 12.

In view of the above discussion, Applicants respectfully submit that the application is in condition for allowance and favorable consideration is requested.

Respectfully submitted,

Daniel S. Ortiz

Daniel S. Ortiz
(Reg. No. 25,123)
Attorney for Applicants
(215) 628-1141

Cognis Corporation, Patent Dept.
300 Brookside Avenue
Ambler, PA 19002

DSO/ras

Enclosure: Webster's New College Dictionary, 3rd Edition, pg. 723

H:\AMEND\C2321.FINAL.DOC

) *n.*, *pl.* **-ties** The molar concentration of a sol… as the number of moles of solute per liter of so…

) *n.* [Port. *melaço* < LLat. *mellaceum*, must < … dark, thick syrup produced in refining sugar.

… *molde* < OFr. *modle* < Lat. *modulus*, dim. of … 1. A hollow form or matrix for shaping a fluid or … 2. A frame or model around or on which an ob… shaped. 3. An object made in or shaped on a mold. … mold. 5. General shape or form. 6. Distinctive … the *mold* of their forefathers> 7. MOLDING 2. … **-ing, molds** 1. To shape in or on a mold. 2a. To form … shape. b. To determine the growth or development … To fit closely. —Used of clothes. 4. To make a mold … **—mold′a•ble** *adj.* **—mold′er** *n.*

… *molde*.] 1. A fungous growth often producing … organic matter. 2. A fungus that causes mold. —*vi.* … **molds** To become moldy.

… < OE *molde*.] 1. Loose, friable soil, rich in hu… 2. *Chiefly Brit. Regional.* a. The earth : the … of the grave. 3. *Obs.* Earth as the substance of …

…rd′) *n.* [MOLD[3] + BOARD.] The curved plate of a … the furrow slice.

… **-ered, -er•ing, -ers** [Prob. of Scand. orig.] —*vi.* To … gradually, as by natural decay : CRUMBLE. —*vt.* To … crumble.

… *n.* 1. Something molded. 2. A strip for decorat… architecture.

… **-i•er, -i•est** 1. Covered with or containing mold. … from age or decay. **—mold′i•ness** *n.*

… < OE *māl*.] A small congenital growth on the hu… slightly raised and dark and occas. hairy.

… *molle*, poss. < MLG *mol*.] 1. Any of various small, … burrowing mammals with thickset bodies bearing … dark-gray fur, rudimentary eyes, tough muzzles, … for digging and usu. living underground. 2. … dark gray.

… < LGk. *mōlos* < Lat. *moles*, mass.] 1. A mas… esp. as a breakwater or to enclose an anchor… The anchorage or harbor enclosed by a mole.

… < Lat. *mola*, millstone.] A uterine mass caused … abortive development of an ovum.

… [G. *Mol*, short for *Molekulargewicht*, molecu… of a substance with a weight in grams nu… the molecular weight of the substance.

…′yə-lər) *adj.* Relating to, consisting of, caused by, … molecules. **—mo•lec′u•lar′i•ty** (-yə-lăr′ĭ-tē) *n.*

… *Physics.* A highly collimated, internally collisionless … for studying electromagnetic phenomena as the … an evacuated chamber.

… The branch of biology that deals with the for… and activity of macromolecules essential to life … role in cell replication and the transmission of … **—molecular biologist** *n.*

… *n.* A chemical formula showing the number of at… in a molecule of a compound.

… *n.* (*sing. in number*). The branch of genetics that … the DNA that codes for specific genes and ma… to study gene functions.

… The branch of medicine that deals with the in… expression on disease processes and with geneti… such as gene therapy.

… The sum of the atomic weights of a molecule's …

…) *n.* [Fr. *molécule* < NLat. *molecula*, dim. of …] 1. A stable configuration of atomic nuclei and … together by electrostatic and electromagnetic forces, … unit displaying the characteristic physi… properties of a compound. 2. A small particle : BIT.

… *n.* A small mound of loose earth thrown up by a …

… *n.* 1. The short, soft, silky fur of the mole. 2a. … cotton twill fabric. b. **moleskins.** Clothing, esp. trou… fabric.

… *vt.* **-lest•ed, -lest•ing, -lests** [ME *molesten* < OFr. *mo*… < *molestus*, troublesome.] 1. To disturb or in… 2. To accost and harass sexually. **—mo′les…**′shan) *n.* **—mo•lest′er** *n.*

… nickname for *Mary*.] *Slang.* 1. A woman com… 2. A prostitute.

… *of* MOLLY.

… *vt.* **-fied, -fy•ing, -fies** [ME *mollifien* < OFr. *mollifier* … *mollis*, soft + *facere*, to make.] 1. To allay the an…ger of : PLACATE. 2. To lessen in intensity : TEMPER. 3. To reduce the rigidity of : SOFTEN. **—mol′li•fi′a•ble** *adj.* **—mol′li•fi•ca′tion** *n.* **—mol′li•fi′er** *n.* **—mol′li•fy′ing•ly** *adv.*

mol•lus•can *also* **mol•lus•kan** (mə-lŭs′kən) *adj.* Of or relating to the mollusks. —*n.* A mollusk.

mol•lus•ci•cide (mə-lŭs′kĭ-sīd′) *n.* [Lat. *molluscus*, soft (< *mollis*) + -CIDE.] A mollusk-killing substance. **—mol•lus′ci•cid′al** *adj.*

mol•lus•cum (mə-lŭs′kəm) *n.*, *pl.* **-ca** (-kə) [Lat., a kind of fungus < neut. of *molluscus*, soft. —see MOLLUSK.] Any of various skin diseases in which soft spherical tumors form on the face or other part of the body.

mol•lusk *also* **mol•lusc** (mŏl′əsk) *n.* [Fr. *mollusque* < NLat. *Mollusca*, phylum name < Lat. *molluscus*, soft < *mollis*.] Any of various members of the phylum Mollusca, largely marine invertebrates, including the edible shellfish and some 100,000 other species. **—mol•lus′cous** (mə-lŭs′kəs) *adj.*

mol•ly *also* **mol•lie** (mŏl′ē) *n.*, *pl.* **-lies** [< NLat. *Mollienisia*, genus name, after Comte François N. *Mollien* (1758–1850).] A tropical or subtropical fish of the genus *Mollienisia*, often seen in aquariums.

mol•ly•cod•dle (mŏl′ē-kŏd′l) *n.* [Brit. slang *molly*, milksop (< the name *Molly*) + CODDLE.] A pampered and protected person. —*vt.* **-dled, -dling, -dles** To be overprotective and indulgent toward. **—mol′ly•cod′dler** *n.*

Mo•loch (mō′lŏk′, mŏl′ək) *n.* [LLat. < Gk. Gk. *Molokh* < Heb. *Mōlek* < Canaanite *mulk*.] In the Bible, the god of the Canaanites and Phoenicians to whom children were sacrificed.

Mo•lo•tov cocktail (mŏl′ə-tôf′, môl′-, mō′lə-) *n.* [After Vyacheslav M. *Molotov* (1890–1986).] A makeshift incendiary bomb made of a breakable container full of flammable liquid and equipped with a rag wick.

molt (mōlt) *v.* **molt•ed, molt•ing, molts** [ME *mouten* < OE *mūtian* < Lat. *mutare*, to change.] —*vi.* To shed an outer covering, as feathers, cuticle, or skin, which is replaced periodically by a new growth. —*vt.* To shed by the process of molting. —*n.* 1. An act or process of molting. 2. The material cast off during molting.

mol•ten (mōl′tən) *v.* *Archaic. var. p.p. of* MELT. —*adj.* 1. Made liquid by heat : MELTED. 2. Made by melting and casting <a *molten* image> 3. Brilliantly glowing.

mol•to (mōl′tō) *adv.* [Ital. < Lat. *multum*.] *Mus.* Very : much. —Used as a direction.

mo•ly (mō′lē) *n.*, *pl.* **-lies** [Lat. < Gk. *mōlu*] A mythical magic herb with black roots and white flowers.

mo•lyb•de•nite (mə-lĭb′də-nīt′) *n.* [MOLYBDEN(UM) + -ITE.] A mineral form of molybdenum sulfide, MoS_2, the chief ore of molybdenum.

mo•lyb•de•num (mə-lĭb′də-nəm) *n.* [NLat. < Lat. *molybdaena*, galena < Gk. *molubdaina* < *molubdos*, lead.] *Symbol* **Mo** A hard, gray, metallic element used to toughen alloy steels; atomic number 42; atomic weight 95.94.

mo•lyb•dic (mə-lĭb′dĭk) *adj.* Designating molybdenum or a compound containing molybdenum in its higher valences.

mo•lyb•dous (mə-lĭb′dəs) *adj.* Designating molybdenum or a compound containing molybdenum in its lower valences.

mom (mŏm) *n.* [Shortening and alteration of MAMMA.] *Informal.* MOTHER[1] 1.

mom-and-pop (mŏm′ən-pŏp′) *adj.* Of or designating a small business run by the owners <a *mom-and-pop* delicatessen>

mo•ment (mō′mənt) *n.* [ME < OFr. < Lat. *momentum* < *movēre*, to move.] 1. A brief indefinite interval of time. 2. A specific point in time, esp. the present <I am eating at the *moment*.> 3. A particular period of importance, significance, or excellence. 4. Outstanding significance or value : IMPORTANCE <a scientific discovery of great *moment*> 5. *Philos.* a. An essential or constituent element. b. A phase or aspect of a thing. 6. *Physics.* a. The product of a quantity and its perpendicular distance from a reference point. b. Rotation produced in a body when a force is applied : TORQUE. 7. *Statistics.* The expected value of a positive integral power of a random variable.

◆ **synonyms:** MOMENT, FLASH, INSTANT, JIFFY, MINUTE, SECOND, TRICE *n.* *core meaning* : a brief but usu. not insignificant period <had to wait a *moment*> <a great *moment* in history> MINUTE, used strictly, is specific; it is also interchangeable with MOMENT <had to wait a *minute*> <a critical *minute* in the testimony> An INSTANT or a FLASH is a period of time almost too brief to detect; each word implies haste and usu. urgency <must have the papers this *instant*> <came in a *flash*> SECOND may be used specifically or loosely as the equivalent of INSTANT <held the lever down for a *second*> <need to see you this *second*> TRICE, a literary term, and JIFFY are usu. preceded by *in a* <in a *trice*> <in a *jiffy*>; they are imprecise but approx. equal in duration to INSTANT.

mo•men•ta (mō-mĕn′tə) *n.* *pl. of* MOMENTUM.

mo•men•tar•i•ly (mō′mən-târ′ə-lē) *adv.* 1. For only a moment. 2. Very soon. 3. From moment to moment.

mo•men•tar•y (mō′mən-tĕr′ē) *adj.* [Lat. *momentarius* < *momentum*, moment < *movēre*, to move.] 1. Lasting only a short time <a *momentary* glimpse> 2. Occurring or present at every moment. 3. Short-